TEST REPORT

Report No.: HK09090899-1

De Ruymbeke Ltd.

Application
For
Certification
(Original Grant)

(FCC ID: XTR301142B)

Transceiver

Prepared and Checked by:

Leung Siu Lung, Michael
Engineer

Approved by:

Chan Chi Hung, Terry
Senior Lead Engineer
Date: January 7, 2010

GENERAL INFORMATION

De Ruymbeke Ltd.
MODEL: 301142

FCC ID: XTR301142B

Grantee:	De Ruymbeke Ltd.
Grantee Address:	22, Bd, Bourre, 13008, Marseille, France.
Contact Person:	Van Ruymbeke
Tel:	0033 491 732712
Fax:	0033 491 732597
e-mail:	office@deruymbeke.fr
Manufacturer:	N/A
Manufacturer Address:	N/A
Brand Name:	Avitron
Model:	301142
Type of EUT:	Transciever
Description of EUT:	X-Tim Avitron R/C Bird
Serial Number:	N/A
FCC ID:	XTR301142B
Date of Sample Submitted:	September 23, 2009
Date of Test:	November 23, 2009
Report No.:	HK09090899-1
Report Date:	January 7, 2010
Environmental Conidtions:	Temperature: +10 to 40°C Humidity: 10 to 90%

SUMMARY OF TEST RESULT

De Ruymbeke Ltd.
MODEL: 301142

FCC ID: XTR301142B

TEST SPECIFICATION	REFERENCE	RESULTS
Maximum Peak Output Power	15.247(b), (c) / RSS-210 A8.4	N/A
Hopping Channel Carrier Frequencies Separation	15.247(e) / RSS-210 A8.1	N/A
20dB Bandwidth of the Hopping Channel	15.247(a) / RSS-210 A8.1	N/A
Number of Hopping Frequencies	15.247(e) / RSS-210 A8.1	N/A
Average Time of Occupancy of Hopping Frequency	15.247(e) / RSS-210 A8.1	N/A
Anteann Conducted Spurious Emissions	15.247(d) / RSS-210 A8.5	N/A
Radiated Spurious Emissions	15.247(d) / RSS-210 A8.5	N/A
RF Exposure Compliance	15.247(i) / RSS-Gen 5.5	N/A
Transmitter Power Line Conducted Emissions	15.207 / RSS-Gen 7.2.2	N/A
Transmitter Field Strength	15.227 / RSS-310 3.8	N/A
Transmitter Field Strength	15.229 / RSS-210 A2.7	N/A
Transmitter Field Strength, Bandwidth and Timing Requirement	15.231(a) / RSS-210 A1.1.1	N/A
Transmitter Field Strength, Bandwidth and Timing Requirement	15.231(e) / RSS-210 A1.1.5	N/A
Transmitter Field Strength and Bandwidth Requirement	15.239 / RSS-210 A2.8	N/A
Transmitter Field Strength and Bandwidth Requirement	15.249 / RSS-210 A2.9	Pass
Transmitter Field Strength and Bandwidth Requirement	15.235 / RSS-310 3.9	N/A
Receiver / Digital Device Radiated Eissions	15.109 / ICES-003	N/A
Digital Device Conducted Emissions	15.107 / ICES-003	N/A

Note: 1. The EUT uses a permanently attached antenna which, in accordance to section 15.203, is considered sufficient to comply with the pervisions of this section.
2. Pursuant to FCC part 15 Section 15.215(c), the 20 dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over excepted variations in temperature and supply voltage were considered.

Table of Contents

1.0 General Description

1.1 Product Description

The equipment under test (EUT) is a 2.4GHz RF transceiver (Controller) for a RF bird. The EUT is powered by 6 x AA batteries. The EUT has an ON/OFF switch, two control sticks and a charging slot. The left control stick is used to control the RC bird flying forward in the different speed. The right control stick is used to control the RC bird turning left and right directions. When the charging slot connects to the corresponding RC bird, the internal battery inside the RC bird can be charged.

Its operating in 2410, 2420, 2430, 2440, 2450 and 2460MHz band, there are 6 channels.

Antenna Type : Integral, External

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

1.2 Related Submittal(s) Grants

The Certification procedure of the corresponding transceiver for this transceiver (with FCC ID: XTR301142A) is being processed as the same time of this application. The receiver portion of this transceiver can be exempted from technical requirement of the FCC Part 15 standard.

1.3 Test Methodology

Radiated emission measurements was performed according to the procedures in ANSI C63.4 (2003). All radiated measurements were performed in an Open Area Test Site. Preliminary scans were performed in the Open Area Test Site only to determine worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the **"Justification Section"** of this Application.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been placed on file with the FCC.

2.0 System Test Configuration

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2003).

The EUT was powered by a new 6 x AA batteries during test.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The unit was operated standalone and placed in the center of the turntable.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was mounted to a plastic stand if necessary and placed on the wooden turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

2.2 EUT Exercising Software

There was no special software to exercise the device. Once the unit is powered up, it transmits the RF signal continuously.

2.3 Special Accessories

There are no special accessories necessary for compliance of this product.

2.4 Equipment Modification

Any modifications installed previous to testing by De Ruymbeke Ltd. will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Intertek Testing Services Hong Kong Ltd.

2.5 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

2.6 Support Equipment List and Description

N/A.

3.0 **Emission Results**

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any), Average Factor (optional) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG - AV

where FS = Field Strength in dBµV/m
RA = Receiver Amplitude (including preamplifier) in dBµV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
AV = Average Factor in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

FS = RR + LF

where FS = Field Strength in dBµV/m
RR = RA - AG - AV in dBµV
LF = CF + AF in dB

Assume a receiver reading of 52.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB are added. The amplifier gain of 29 dB and average factor of 5 dB are subtracted, giving a field strength of 27 dBµV/m. This value in dBµV/m was converted to its corresponding level in µV/m.

RA = 52.0 dBµV/m
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
AV = 5.0 dB
RR = 18.0 dBµV
LF = 9.0 dB
FS = RR + LF
FS = 18 + 9 = 27 dBµV/m

Level in µV/m = Common Antilogarithm [(27 dBµV/m)/20] = 22.4 µV/m

3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission at 7290.000 MHz

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgment: Passed by 0.5 dB

Company: De Ruymbeke Ltd. Date of Test: November 23, 2009
Model: 301142 – Channel 1
Mode: Controller TX
Sample: 1/1

Table 1

Radiated Emissions

Channel 1

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	2410.000	86.8	33	29.4	83.2	114.0	-30.8
H	4820.000	51.1	33	34.9	53.0	74.0	-21.0
H	7230.000	47.9	33	37.9	52.8	74.0	-21.2
H	9640.000	43.0	33	40.4	50.4	74.0	-23.6
H	12050.000	41.7	33	40.5	49.2	74.0	-24.8

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Calculated at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	2410.000	86.8	33	29.4	0	83.2	94.0	-10.8
H	4820.000	51.1	33	34.9	0	53.0	54.0	-1.0
H	7230.000	47.9	33	37.9	0	52.8	54.0	-1.2
H	9640.000	43.0	33	40.4	0	50.4	54.0	-3.6
H	12050.000	41.7	33	40.5	0	49.2	54.0	-4.8

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative sign in the column shows value below limit.

4. Horn antenna is used for the emissions over 1000MHz.

Company: De Ruymbeke Ltd. Date of Test: November 23, 2009
Model: 301142 – Channel 3
Mode: TX
Sample: 1/1

Table 2

Radiated Emissions

Channel 3

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
H	2430.000	85.4	33	29.4	81.8	114.0	-32.2
H	4860.000	47.6	33	34.9	49.5	74.0	-24.5
H	7290.000	48.6	33	37.9	53.5	74.0	-20.5
H	9720.000	40.2	33	40.4	47.6	74.0	-26.4
H	12150.000	41.0	33	40.5	48.5	74.0	-25.5
H	14580.000	43.6	33	38.4	49.0	74.0	-25.0

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Calculated at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
H	2430.000	85.4	33	29.4	0	81.8	94.0	-12.2
H	4860.000	47.6	33	34.9	0	49.5	54.0	-4.5
H	7290.000	48.6	33	37.9	0	53.5	54.0	-0.5
H	9720.000	40.2	33	40.4	0	47.6	54.0	-6.4
H	12150.000	41.0	33	40.5	0	48.5	54.0	-5.5
H	14580.000	43.6	33	38.4	0	49.0	54.0	-5.0

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative sign in the column shows value below limit.

4. Horn antenna is used for the emissions over 1000MHz.

Company: De Ruymbeke Ltd. Date of Test: November 23, 2009
Model: 301142 – Channel 6
Mode: Controller TX
Sample: 1/1

Table 3

Radiated Emissions

Channel 6

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
H	2460.000	86.6	33	29.4	83.0	114.0	-31.0
H	4920.000	51.3	33	34.9	53.2	74.0	-20.8
H	7380.000	48.1	33	37.9	53.0	74.0	-21.0
H	9840.000	43.4	33	40.4	50.8	74.0	-23.2
H	12300.000	41.7	33	40.5	49.2	74.0	-24.8

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Calculated at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
H	2460.000	86.6	33	29.4	0	83.0	94.0	-11.0
H	4920.000	51.3	33	34.9	0	53.2	54.0	-0.8
H	7380.000	48.1	33	37.9	0	53.0	54.0	-1.0
H	9840.000	43.4	33	40.4	0	50.8	54.0	-3.2
H	12300.000	41.7	33	40.5	0	49.2	54.0	-4.8

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative sign in the column shows value below limit.

4. Horn antenna is used for the emissions over 1000MHz.

Company: De Ruymbeke Ltd. Date of Test: November 23, 2009
Model: 301142
Mode: Charging Mode
Sample: 1/1

Table 4

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	38.426	38.4	16	10.0	32.4	40.0	-7.6
V	54.671	38.6	16	11.0	33.6	40.0	-6.4
V	63.784	41.0	16	9.0	34.0	40.0	-6.0
H	108.724	36.1	16	14.0	34.1	43.5	-9.4
H	135.596	35.6	16	14.0	33.6	43.5	-9.9
H	162.569	32.5	16	16.0	32.5	43.5	-11.0

Notes: Negative signs (-) in the margin column signify levels below the limit.

4.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf and internal photos.pdf.

5.0 Product Labelling

For electronics filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

6.0 Technical Specifications

For electronic filing, the block diagram and schematic of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

7.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

8.0 Miscellaneous Information

The miscellaneous information includes details of the test procedure and Bandedge Plot.

8.1 Bandedge Plot

For electronic filing, the plots show that the fundamental emissions are confined in the specified band (2400MHz to 2483.5MHz). In case of the fundamental emissions are within two standard bandwidths from the bandedge, the delta measurement technique is used for determining bandedge compliance. Standard bandwidth is the bandwidth specified by ANSI C63.4 (2003) for frequency being measured.

Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50dB below the level of the fundamental or to the general radiated emissions limits in Section 15.209, whichever is the lesser attenuation, which meet the requirement of part 15.249(d).

8.1 Bandedge Plot (cont'd)

Peak Measurement

Bandedge compliance is determined by applying marker-delta method,

Resultant field strength = Fundamental emissions (peak value) – delta

= 83.20 dBµV/m – 46.43 dB

= 36.77 dBµV/m

The resultant field strength meets the general radiated emission limit in section 15.209, which does not exceed 74 dBµV/m (Peak Limit) and 54 dBµV/m (Average Limit).

For electronic filing, the above plot are saved with filename: be.pdf

8.2 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of transmitters operating under Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 - 2003.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjusted through all three orthogonal axes to obtain maximum emission levels. The antenna height and polarization are varied during the testing to search for maximum signal levels.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in Exhibit 8.3.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower. For line conducted emissions, the range scanned is 150 kHz to 30 MHz.

8.2 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements are made as described in ANSI C63.4 - 2003.

The IF bandwidth used for measurement of radiated signal strength was 10 kHz for emission below 30 MHz and 120 kHz for emission from 30 MHz to 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Exhibit 8.2). Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the restricted bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, but those measurements taken at a closer distance are so marked.

9.0 **Equipment List**

Radiated Emissions Test

Equipment	EMI Test Receiver	Biconical Antenna	Log Periodic Antenna	Active H-field Loop Antenna
Registration No.	EW-0016	EW-0954	EW-0446	EW-0191
Manufacturer	R&S	EMCO	EMCO	EMCO
Model No.	ESVS30	3104C	3146	6502
Calibration Date	Apr. 14, 2009	Sep. 30, 2008	Oct. 02, 2008	Jun. 26, 2008
Calibration Due Date	Apr. 14, 2010	Mar. 30, 2010	Apr. 02, 2010	Dec. 26, 2010

Equipment	Spectrum Analyzer	Double Ridged Guide Antenna	Double Ridged Guide Antenna
Registration No.	EW-2188	EW-0194	EW-1015
Manufacturer	AGILENTTECH	EMCO	EMCO
Model No.	E4407B	3115	3115
Calibration Date	Dec. 18, 2008	Dec. 24, 2008	Jul. 28, 2008
Calibration Due Date	Dec. 18, 2009	Jun 24, 2010	Jan. 28, 2010